

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
5 April 2001 (05.04.2001)

PCT

(10) International Publication Number  
**WO 01/23411 A3**

(51) International Patent Classification<sup>7</sup>: C12Q 1/68, 1/48,  
C12P 19/34, C12N 15/01

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(21) International Application Number: PCT/US00/26900

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(22) International Filing Date:  
29 September 2000 (29.09.2000)

(81) Designated States (*national*): JP, US.

(25) Filing Language: English

(84) Designated States (*regional*): European patent (AT, BE,  
CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,  
NL, PT, SE).

(26) Publication Language: English

(30) Priority Data:  
60/157,204 30 September 1999 (30.09.1999) US

Published:  
— with international search report

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(88) Date of publication of the international search report:  
18 October 2001

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*For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.*

(54) Title: INCORPORATION OF MODIFIED NUCLEOTIDES BY ARCHAEON DNA POLYMERASES AND RELATED METHODS

(57) Abstract: The present invention is directed toward improving the efficiency of chain terminator incorporation by Family B archaeon DNA polymerases. Previously, the low efficiency of ddNTP, and more especially dye-labeled ddNTP, incorporation has limited the usefulness of this group of DNA polymerases in protocols requiring chain terminator incorporation.

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/26900

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : C12Q 1/68, 1/48; C12P 19/34; C12N 15/01

US CL : 435/6, 15, 91.1, 442,

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/6, 15, 91.1, 442, 183, 193, 194

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
SPIC search SEQ ID NO: 4

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,558,991 A (TRAINOR et al) 24 September 1996, see entire document, especially claims.	1-7, 19-26
Y	US 5,500,363 A (COMB et al) 19 March 1996, see entire document, especially claims.	1-7, 19-26
Y	ILSEY et al. Incorporation of Fluorescent Nucleotides by DNA Polymerases. FASEB J. May 1999, Vol. 13, page A1441, Abstract No. 627.	1-7, 19-26
Y	REID et al. Insertion and Extension of Acyclic, Dideoxy, and Ara Nucleotides by Herpesviridae, Human $\alpha$ and $\beta$ Polymerases. J. Biol. Chem. 15 March 1988, Vol. 263, No. 8, pages 3898-3904.	1-7, 19-26

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 23 FEBRUARY 2001	Date of mailing of the international search report 05 APR 2001
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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/26900

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,723,298 A (OOMMEN et al) 03 March 1998, see entire document.	1-7, 19-26
Y	US 5,436,149 A (BARNES) 25 July 1995, see entire document.	1-7, 19-26
A	US 5,928,906 A (KOSTER et al) 27 July 1999, see entire document.	1-7, 19-26

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/26900

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 8-18 and 27-31  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/26900

### B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

Stn (Medline, CAPLUS, Biosis, Japio, Embase, Scisearch, Patoswo, Patosep), EAST  
search terms: acyclonucleotide, Dideoxynucleotide, derivative, DNA Sequenc?, DNA Polymerase, Archaeon, Vent  
polymerase, Pfu polymerase